



National Institute of Industrial Technology, INTI.  
Dairy Industry Technological Research Centre. INTI LACTEOS  
Buenos Aires. Argentina.

# "Reference system and centralized calibration for milk recording testing in Argentina."

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ICAR Reference Laboratory Network.  
Niagara Falls. USA. June 16, 2008

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June 16/2008.

Reference system and centralized  
calibration for milk recording testing in  
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## Dairy sector in Argentina

**Milk production in Argentina: 10 billion liters in 2006**

**11° place in the ranking of milk world producer.**

**2nd place in Latin America.**

**2.5 million dairy cows.**

**Most of them "holando argentina" breed.**

**94.5 % of the milk produced is in Pampeana Region  
(800.000 km<sup>2</sup>)**

**14.000 dairy farms**

**1.100 dairies of different sizes.**

**Destine of milk: cheese (45%), milk powder (24%), fluid  
milk (19%).**

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In 1880 “*Holando Argentina*” breed was introduced from Holland.



The *Holando-Argentina* cows are medium sized with the height of 1.40 to 1.5 meters. These animal have a large barrel allowing them to have a high intake of forage.

In 1944, breeders create an organization to promote the breed and to provide necessary technical support named *Holando- Argentina* Breeders Association, ACHA.



In 1981, de government (Department of Agriculture) delegate by law the “official milk control” system in ACHA.

In 1991 is a full member of ICAR.

In 2003 ACHA subscribed an agreement with INTI for the creation of a technical assistance and control laboratory network.

In 2004, DHI laboratories are obliged to participate in proficiency testing schemes under REDELAC, the network of INTI.

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Nowadays we have:

2.000 dairy farms in “official milk control”

510.000 cows under this system

11 DHI laboratories that analyze the composition of the milk.

A reference national laboratory that control the performance of DHI laboratories.

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### INTI Lácteos

#### Dairy Industry Technological Research Centre.

**2 work places: in Buenos Aires and Rafaela.**

**75 professionals and technicians.**

**Laboratories for milk quality, physicochemical testing, microbiology, residues and contaminants, sensory evaluation, and others.**

**Modern equipment.**

## INTI LACTEOS: National Reference Laboratory

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# INTI LACTEOS: National Reference Laboratory



INTI Lácteos is one of the 35 centers of INTI, the Argentine Institute of Metrology.

Reference National Laboratory for "milk control" systems (ACHA) and for milk payment purposes (Agriculture Ministry).

Quality system according ISO 17025 accredited by OAA (National Organization of Accreditation.)

PT provider in Argentina and the south american region.

Quality system according ISO 43/Guide ILAC G 13 accredited by ENAC (Spanish Organization of Accreditation).

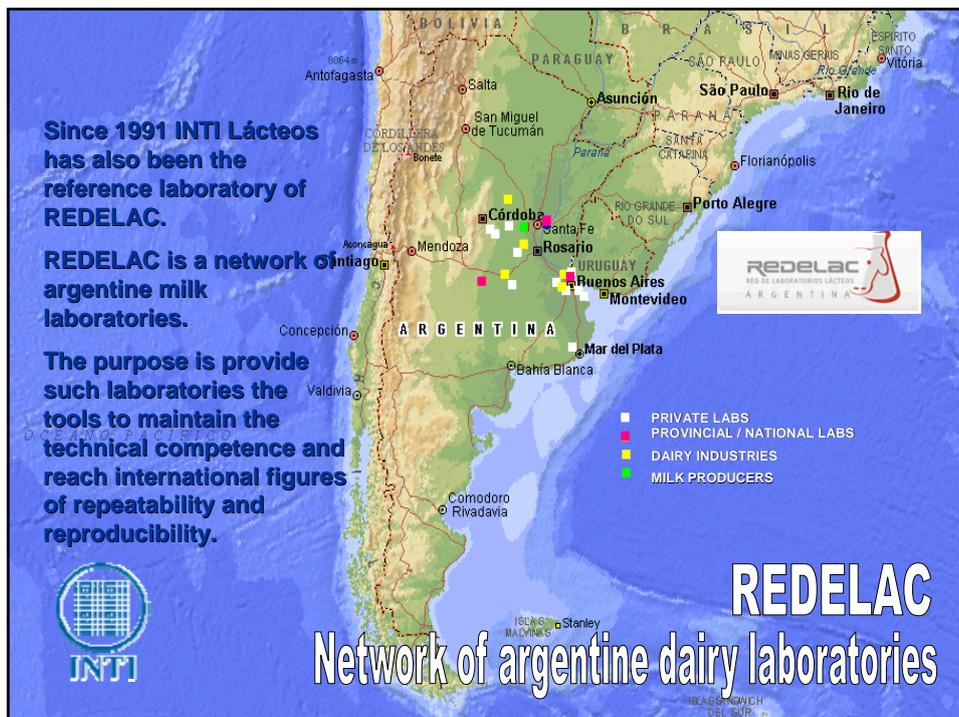
Standard reference samples provider.

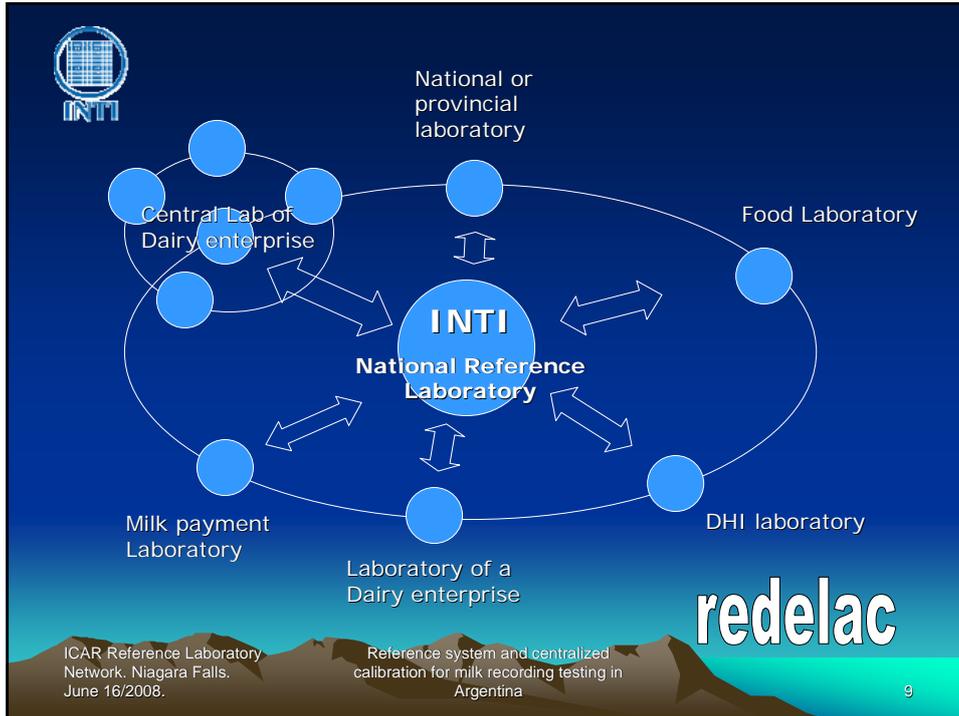
Quality system according ISO 31 – 35. To be accredited.

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- ## Assistance and external control
- ➡ **Centralized calibration.**
  - ➡ **Control of performance of laboratories.**
  - ➡ **Evaluation of results.**
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SICECAL is a system of preparation, analysis and delivery of reference materials in dairy matrix for calibration and control equipment. It is a widely used tool in Argentina.



❖ **calibration of infrared analyzers** (fat, proteins, totals solids, lactose, ash)

❖ **adjustment of fluoro-opto-electronic equipment** for somatic cell count

This Reference Materials are produced according the requirements in guide ISO 35.

11 and 5 samples of raw milk are sent in **the first week** of the month. Composition: fat: 2.50 to 5.00 g/100 ml, protein: 3,00 to 3.60 g/100 ml, lactose: 4.60 to 5.00, ash: 0.68 to 0.82 and dry matter content: 11.80 to 13.80.

3 samples of raw milk are sent in the first week of the "pair" months. Composition: somatic cells counting low (170.000 cel/ml); medium (430.000 cel/ml); and high (700.000 cel/ml)

## centralized calibration (Sicecal)

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With these samples, laboratories calibrate, re-calibrate, verify or adjust testing equipment.

Samples are prepared with mixed raw milk.

Reference value: by IDF reference methods (quadruplicate).

Check of the reference value (previous SICECAL): in 4 IR-equipment or SC-equipment in recognized laboratories.

Test of homogeneity and stability. According to the requirements in guide ISO 35 and the document "Statistical Aspects of the certification of chemical batch SRMs of the NIST.



## centralized calibration

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1. **Monthly check** of results of laboratories. Every second Tuesday of the month, (one week after centralized calibration), laboratories receive one sample to analyze fat, total proteins and somatic cells count by their routine methods. They are obliged to send results in time to INTI Lácteos.
2. **Bi-annual interlaboratory trial.** Each six month, the laboratories receive 10 samples to analyze fat, total proteins and SCC. They must submit results in time to INTI Lácteos.

## Control of performance of DHI laboratories

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DHI Laboratories are controlled by the INTI Lácteos by comparison of the results with these samples.

This inter-comparison scheme is improved under an ISO 43 / ILAC G13 quality system.

Samples are prepared with mixed raw milk. Composition: 2.5-4 % of fat, 2.8-3.5 % total proteins, 100.000-700.000 SCC, and others.

Test of homogeneity and stability. According ISO 13528.

Results of the laboratory are compared against the reference value.

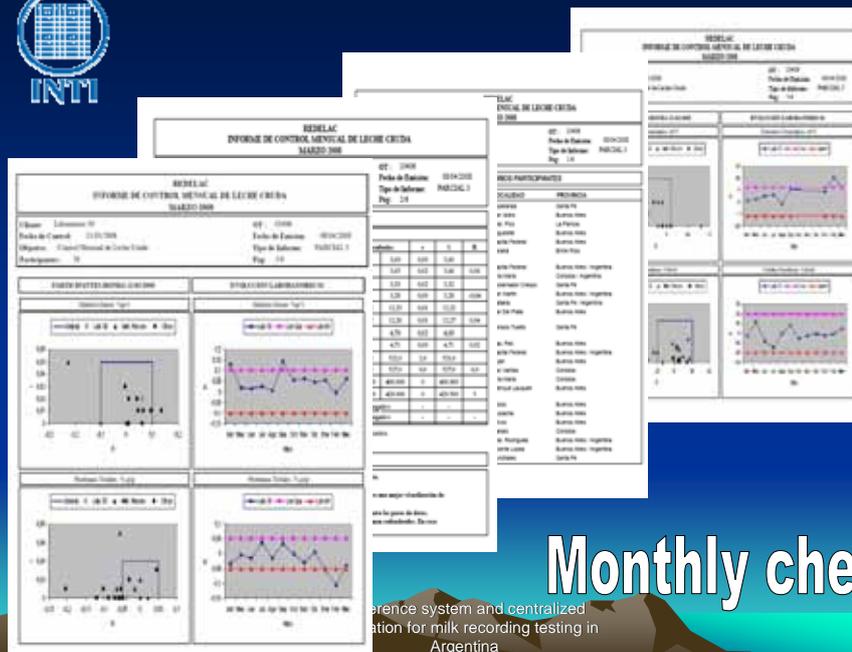
Reference value: by IDF reference methods (duplicate).

Check of the reference value: the reference value must be not statistically different of the robust media (of 26 laboratories). If yes, the NRL studied the reason and decide which reference will be use.

# Monthly check

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# Monthly check

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Each six month, DHI Laboratories must participate in an interlaboratory trial for fat, total proteins and SCC.

This inter-comparison scheme is improved under an ISO 43 / ILAC G13 quality system accredited by ENAC.

The NRL send 10 different samples for each component. They are prepared with mixed raw milk as IDF Standard 141:2000 (separation and recombination of components).

Composition: range of 2.5-4 % for fat; 2.5-3.5 % for total proteins; and 100.000-700.000 for SCC.

Test of homogeneity and stability. According ISO 13528.

Reference value: by consensus of all laboratories, calculating robust media. INTI Lácteos analyze IDF reference methods (duplicate).



## Bi-annual interlaboratory trial

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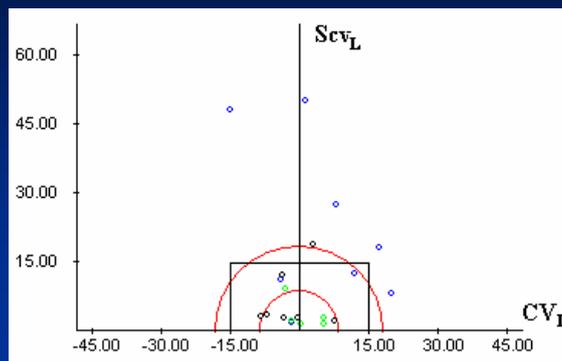
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### RECUESTO DE CELULAS SOMATICAS TOTALES

20 Laboratorios  
10 muestras

70% de los Laboratorios participantes dentro de la superficie de conformidad



70 % de los laboratorios bajo el primer semicírculo.  
45% de los laboratorios bajo el segundo semicírculo.  
Los laboratorios fueron diferenciados de la siguiente manera, según el método empleado para el análisis:

- ◆ Microscopía Óptica
- ◆ Fossomatic
- ◆ Somacount

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The results of these reports are analyzed by an INTI-ACHA Advisory Committee created within the framework of the technological linkage agreement subscribed by both institutions.

This advisory committee hold meeting every two month and decides the actions to follow according the evaluation of each laboratory.

## Evaluation of results

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These metrological scheme permit Argentina maintain a good traceability between laboratories and international institutions by means of inter-comparisons.

## traceability

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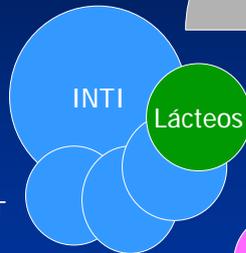
# traceability



traceability



International PT schemes.



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The reference system for milk recording testing in Argentina is based on the action of a national reference laboratory and dairy laboratories, which interchange information, technical assistance and control mechanisms.



The characteristics of our country and our milk permit a centralized calibration and a frequent control for milk recording testing.

In this way, Argentina maintains a good traceability scheme between laboratories and international institutions by means of inter-comparisons.

This characteristics shows a metrological system for milk measurements according the importance of the argentine dairy industry.

# conclusions

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## Reference system and centralized calibration for milk recording testing in Argentina

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# thank you ! muchas gracias...

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